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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/597,161	06/20/2000	Ichiro Okabe	025311/0105	5143

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FOLEY AND LARDNER
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EXAMINER

DIAZ, JOSE R

ART UNIT PAPER NUMBER

2815

DATE MAILED: 08/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/597,161

Applicant(s)

OKABE ET AL.

Examiner

José R Díaz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 30 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3 and 5-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 5-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 30, 2003 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 3 and 6-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) Claim 1 recites the limitation "the surface of the silicon-based film" at the end of the paragraph. There is insufficient antecedent basis for this limitation in the claim.

b) Further, it is not clear to the examiner how the imitations of "the surface" in claim 1 and "a surface" in claim 3 are related. Clarification is required.

c) Claims 6 and 7 are rejected due to their dependency on claim 1.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 3, and 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Cheung et al. (EP 0 840 361 A2).

a) Regarding claims 1 and 5, Cheung et al. teach a method for deposition a film over a substrate comprising the steps of: forming a silicon-oxide-based film (240) on a substrate (200) by a PECVD process (see Fig. 3A, col. 5, lines 12-36, and Section IV: "Deposition of a Capping Layer or Hardmask" in cols. 19-20,); forming a chemically-amplified photoresist (22) (see Fig. 3A and col. 5, lines 12-36); transferring a mask pattern onto the chemically-amplified photoresist layer (see Fig. 3A and col. 5, lines 12-36); and etching the underlying layer (see Fig. 3A and col. 5, lines 12-36), wherein the nitrogen content of the surface of the silicon-oxide-based film is made to about a non-zero value 0.1 atm % or less (col. 5, lines 13-17, col. 15, lines 36-37; col. 16, lines 14-16; col. 19, lines 48-50; and col. 20, lines 17-23).

b) Regarding claim 3, Cheung et al. teach a further step of exposing the silicon oxide based film to a plasma atmosphere of O₂ or N₂O (see col. 5, lines 2-5; col. 19, lines 25-58 and col. 20, lines 1-59).

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c) Regarding claim 6, Cheung et al. teach forming the silicon-oxide-based at a temperature of 400 °C or more by means of a PECVD (see col. 19, lines 40-42 and col. 20, lines 28-31).

d) Regarding claim 7, Cheung et al. teach that the silicon-oxide-based is formed by using NO or N₂O (see col. 19, lines 40-53).

Response to Arguments

6. Applicant's arguments filed June 30, 2003 have been fully considered but they are not persuasive. With regards to the arguments about the "non-zero value of 0.1 atm% or less", the examiner believes that the reference Cheung et al. still anticipates the claimed limitation by disclosing a layer having a low concentration of nitrogen, e.g. an amount close to 0 atm % of nitrogen, which is essentially what applicant is claiming (see col. 19, lines 48-50 and col. 20, lines 17-23 of Cheung et al.). Therefore, the rejection is considered to be proper since Cheung et al. teaches the claimed limitation.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references teach the use of a silicon oxide layer having a low content of nitrogen to reduce the problem of footing: Ngo et al. (US Pat. No. 6,093,973), col. 4, lines 13-18; and Okabe et al. (US Pat. No. 6,586,163 B1), abstract.

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Correspondenc

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R Díaz whose telephone number is (703) 308-6078. The examiner can normally be reached on 9:00-5:00 Monday, Tuesday, Thursday and Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 746-3891 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JRD
July 31, 2003


GEORGE ECKERT
PRIMARY EXAMINER